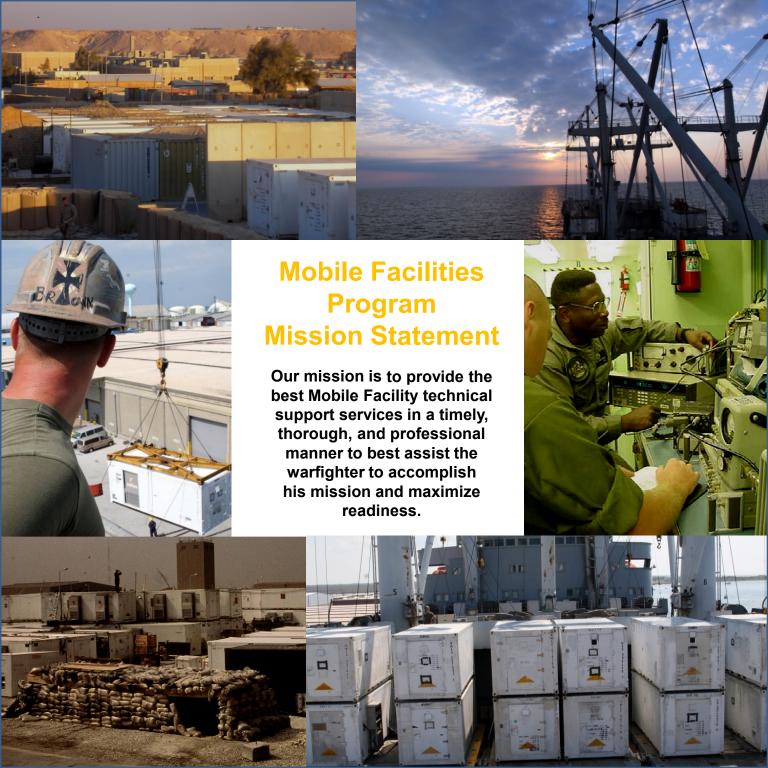


MOBILE FACILITY PROGRAM THE FINEST • ANYTIME • ANYPLACE





During World War II the task of maintaining and repairing Navy and Marine Corps tactical aircraft was relatively simple. Working out of tents and hastily constructed shacks and using common hand tools, the ground support maintenance and repair crews kept their propeller planes flying, even under the most adverse conditions of front line battle operations. However, with the introduction of highly complex jet aircraft in the fifties, World War II maintenance and repair techniques became obsolete.

Research indicated trailer-type vans could be used to alleviate maintenance and repair problems peculiar to jet aircraft. Furthermore, vans would provide a dust-free, temperature and humidity-controlled environment for servicing, testing, and repairing the complex avionics equipment.

The Navy purchased its first 67 vans in 1961 to support the initial Marine Corps Short Airfield for Tactical Support (SATS) concept. Although they were lightweight and easily transportable, these 12-1/2 foot long Consolidated Diesel Model 2111/2112 vans could not provide enough work space to maintain the increasingly sophisticated communications and weapons systems.

Consequently, in 1964, the Navy purchased 20-foot long Model 3010 vans from Gichner Iron Works and also began using butting kits to integrate individual vans into complexes.







A standard-size van, called tactical shelter or mobile facility (MF), was finally adopted in 1975 and the military commercial sea-land containerization concept became a reality. From this time on, all MF construction and associated military specifications reflected International Organization for Standards (ISO) and American National Standard Institute (ANSI) container requirements. In fact, the NAVAIR MF was the first Department of Defense (DOD) tactical shelter meeting ISO/ANSI criteria to be mass-produced by any of the military services. Today, MFs in various aircraft support configurations are serving aboard aircraft carriers and amphibious warfare ships as portable workshops. These self contained workshops provide immediate and economical aircraft maintenance support; are designed for land, sea, or air travel; and can be relocated with an aircraft squadron anywhere in the world and be operational within a few hours.







Program equipment is both durable and efficient, with NAVAIR exercising life cycle management of most of the equipment. The primary component is the Mobile Facility (MF), a tactical shelter, which meets the stringent structural and dimensional requirements of the International Organization for Standardization (ISO) and the American National Standards Institute (ANSI).

NAVAIR's Mobile Facility Program answers an unlimited variety of needs for any member of the Department of Defense team but particularly the Navy-Marine Corps team with an operational or support function conducive to containerization.

As a result of over 35 years of experience and the design, integration, fielding, and logistics support of more than 7,500 shelters, the Program provides the equipment and know-how required to ensure that sophisticated aircraft and other weapon systems can be maintained in environmentally controlled spaces, even in the most austere locations supporting expeditionary operations worldwide. With this Program, personnel can deploy tactical weapon systems to any combat theater in the world and operate them indefinitely from any expeditionary location.



Seven different models, designed for a 20-year service life, are heated and cooled by an energy-efficient, mechanically reliable environmental control unit, which the Program procures and logistically supports. In tactical environments, electrical power required to support mobile facility complexes is provided by DOD-standard generator sets. Local and long distance transportation is accomplished using appropriately sized forklifts, air-ride flatbed trailers, and local handling equipment enabling users to load or unload the shelter directly to or from a cargo aircraft and move it to the required location.



Integration units are used to join MFs together to form a total environmentally controlled complex. Integrated complexes now support a variety of maintenance shops, supply support spaces, production control facilities, and other functions necessary to sustain the support of tactical aircraft and other tactical systems during combat operations around the world.

A significant benefit of NAVAIR mobile facility shelters is their ability to be complexed together to create specialized work spaces. Using end doors and removable side panels, the shelters can be joined together to form larger complexes providing larger interior spaces.







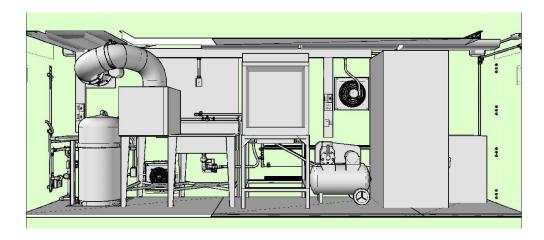
From a modest beginning more than three decades ago, the use of Mobile Facilities (MFs) has expanded from an avionics system repair facility to include a wide range of applications. There are now over 500 different internal configuration designs in use by the Navy, Marine Corps and Department of Defense (DOD) activities. Many new designs are under review or are on the drawing board.

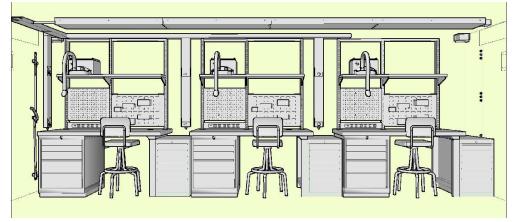
There are several functional categories of MFs presently in use. These include maintenance shops, supply shops, supply support spaces, administrative units and operational facilities. Maintenance shops provide facilities for avionics repair, micro-miniature component repair, machine shop work, and automated test equipment. Supply support MFs are used in conjunction with the maintenance shops. Administrative office, production control, and quality assurance functions are accomplished in administrative MFs. Some special MF complexes include Navy/ Marine Corps meteorological, Navy/Marine Corps aerial photographic imagery processing, automatic data processing, and many other unique complexes.



Development of the new mobile facility side opening (Type A and Type B in 1979, Type C in 1986) added new dimension to mobile facility utilization. Positioning two or more side opening mobile facilities adjacent to each other to create unlimited continuous floor space can now accommodate applications previously considered impractical because of limited floor space of a single unit. Applications for mobile facility side opening include automatic test equipment installations, classrooms, conference rooms, and airframe maintenance.

The Program employs the latest engineering technology to meet customer requirements. 3-D modeling allows for delivery of timely and cost effective solutions. Engineers continue to design mobile facilities to support functions requiring a high degree of mobility. **Tactical and** operational situations requiring enhanced mobility are expected to increase significantly in the future.

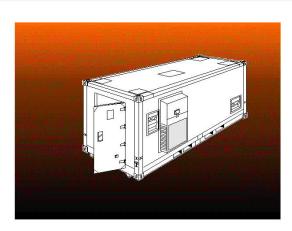








There are seven basic mobile facility shells and 513 different configurations.

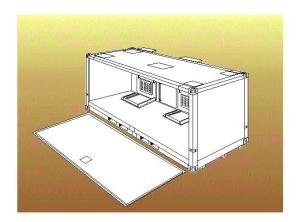


Basic MF A/MF B

The Basic Mobile Facility is a fundamental tactical shelter 8-feet high, 8-feet wide and 20-feet long, constructed of foam and beam material with an exterior surface of white painted aluminum. The MF can be internally configured as a maintenance, supply, operations, administrative, or personnel support re-locatable facility. It is transportable by land, sea, and air. The basic mobile facility includes forklift pockets and can be transported short distances using an appropriately rated forklift. The basic mobile facility is not compatible with rail transit due to the potential for sustained vibration damage. Large 48-inch by 76-inch end doors permit end-to-end positioning of two or more mobile facilities supporting complexing operations.

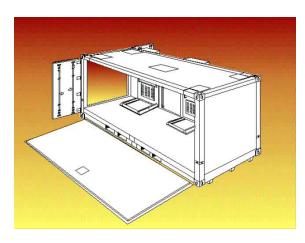
SOMF A

The Mobile Facility Side Opening Type A has one personnel door at each end. The left side contains two removable panels where environmental control units may be installed. The right side contains a removable side panel assembly. When removed, the side panel assembly stores securely on the roof. Removal of the side panel assembly allows the SOMF Type A to join another SOMF side by side.



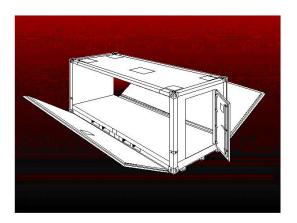
SOMF B

The Mobile Facility Side Opening Type B has no end personnel doors. The left side contains two removable panels where environmental control units may be installed. A small, non-standard door is installed between environmental control unit removable panels. The right side contains a removable side panel assembly. When removed, the side panel assembly stores securely on the roof. Removal of the side panel assembly allows the SOMF Type B to join another SOMF side by side.



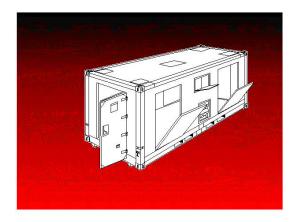
SOMF B (Modified)

The Mobile Facility Side Opening Type B (Modified) is identical to the SOMF Type B, except that large double doors are installed at the rear of the mobile facility. The double doors allow large equipment to be brought into the mobile facility for repair or other work.



SOMF C

The Mobile Facility Side Opening Type C has one personnel door at the front end. Each side contains a removable side panel assembly, both side panel assemblies store securely on the roof. Removal of the side panel assemblies allows the SOMF Type C to join another SOMF side by side.



INU

The Integration Unit provides a method of joining basic, side opening and integration unit mobile facilities into a functional, environmentally controlled complex. The INU also serves as a corridor, an electrical power distribution control unit, and a production control supervisory/ administrative workspace.

The dimensions of the unit are identical to the basic mobile facility. The INU is equipped with 48-in by 76-in end doors, identical to the basic MF. The integration unit mobile facility also features three removable side panels of the same size, two on the left side and one on the right side.

These doors and panels permit mobile facilities to be attached to either the end or side of the INU. Different from other Mobile Facilities, the INU incorporates a removable window-type air conditioner.

Military Specs MIL-M-81957(AS)

ISO/ANSI Specs ISO 1496/1 and ANSI MH5.1, 5.1.1 and 5.4

ASTM

Designation: PS 27 - 95

Exterior Dimensions 96in. high, 96in. wide, 238 1/2 in. long

Interior Dimensions 84 5/16 in. high x 89 13/16 in. wide x 232 5/16 in. long

Exterior Finish
Glossy white polyurethane

Maximum Payload 15, 800 lbs.

Roof Loads
Live load of 660 lbs on
an area 24 in. by 12 in.;
or 75 lb./ft. 2
uniform snow load

Doors
48 in. by 76 in.;
Located at each end
of the mobile facility

Floor Loads
138 lbs/ft2 uniform loads

Wall, Roof & Floor Attachments 2,000 lb. pullout and 40 inch-lb torque Transportability
All modes

Shelter Tare Weight 4,200 lbs.

Heat Transfer
Insulated to provide
a heat transfer coefficient
of
0.25 BTU/hr. ft. 2/°F

Temperature Range
Operation: -40°F to
+ 125°F plus solar
load to minimum
of +180°F. Storage
-65°F to + 160°F

Service Life
15 years service,
20 years storage

			EXTERIOR DIMENSIONS			INTERIOR DIMENSIONS					
MODEL NO.	DESCRIPTION	SPEC	H (in)	W (in)	L (in)	H (in)	W (in)	L (in)	SHELTER WEIGHT (LBS)	PAYLOAD (LBS)	OUTLINE DWG.
1339AS500-1	Side Opening MF (SOMF)-Type A	MIL-M- 81957	96	96	238- 1/2	84- 5/16	89- 13/16	232- 5/16	4900	15.800	7006540
1339AS501-1	Side Opening MF (SOMF)-Type B	MIL-M- 81957	96	96	238- 1/2	84- 5/16	89- 13/16	232- 5/16	4300	15.700	7006541
1339AS1101-1	Side Opening MF (SOMF)-Type C	MIL-M- 81957	96	96	238- 1/2	84- 5/16	89- 13/16	232- 5/16	4300	15.700	1339AS1101
1339AS1100-1	Side Opening MF (SOMF)-Double Doors	MIL-M- 81957	96	96	238- 1/2	84- 5/16	89- 13/16	232- 5/16	4300	15.700	1339AS1100

Note: All shelters listed above are nominal 8'W x 8'H x 20'L, ISO shelters are also available in 10', 30' and 40' lengths.







NAVAIR mobile facilities (MFs) purchased since 1975 comply with applicable International Organization for Standardization (ISO)/American National Standards Institute (ANSI) dimensional and structural container requirements and the provisions of American Society for Testing and Materials (ASTM), Provisional Standard 27-95 (PS 27-95), Engineering and Design Criteria for Rigid Wall Relocatable Structures. Standardization features enhance mobility of tactical shelters and promote intraservice/interservice coordination and joint operations. Mobile facilities may be transported by land, sea, and air and are especially adaptable to container ships and military cargo aircraft. The MF is a member of the Department of Defense (DoD) standard family of shelters authorized for military service use by DoD Instruction 4500.37.

These shelters are designed in accordance with military specification MIL-M-81957 (AS) and meet the ISO/ANSI specification 1496/1 and ANSI MH5.1, 5.1.1, and 5.4d. Mobile Facilities Program requirements dictate that MFs be certified in accordance with Department of Transportation-mandated Convention for Safe Container (CSC) certification. The MF is included as an authorized container for DoD use with the Joint Committee on Tactical Shelters (JOCOTAS). Facilities are not compatible with rail transit due to the potential for sustained vibration damage.

We are currently transitioning to the new R134 ECU for the 3 ton unit. The 5 ton unit may be procured to meet unique user requirements, but is not a standard inventory item. Below you will find data on both. For publications listed below please download them from the NATEC website. If not available through NATEC check our "Tech Manual" section of our website at www.mobile-facilities.com.



R22 ECU - 3 TON

NSN: 014423954 **Part #**: 1559AS100-1

Nomenclature: Environmental control unit, 3 ton

TEC: GEC6

Type Designator: A/E 32C-45 **MFG:** Environmental Systems

Manual: NA 19-60-83

Pre-Op's: NA 19-600-141-6-1 MRC's: NA 19-600-141-6-2



R22 ECU - 5 TON

NSN: 013552854 **Part #:** 2026AS100-1

Nomenclature: Environmental control unit, 5 ton

TEC: GEC8

Type Designator: A/E 32C-48 **MFG:** Environmental Systems

Manual: NA 19-60-89

Pre-Op's: NA 19-600-273-6-1 MRC's: NA 19-600-273-6-2

R134 ECU - 3 TON

NSN: 015502063 Part #: 1559AS400-1

Nomenclature: Environmental

control unit, 3 ton **TEC:** GEC6

Type Designator: A/E 32C-45 A **MFG:** Environmental Systems

Manual: NA 17-1-573

Pre-Op's: NA 17-600-762-6-1 MRC's: NA 17-600-762-6-2



R134 ECU - 5 TON

NSN: 015521698 **Part #**: 2026AS400-1

Nomenclature: Environmental

control unit, 5 ton TEC: GEC8

Type Designator: A/E 32C-48 A **MFG:** Environmental Systems

Manual: NA 17-1-568

Pre-Op's: NA 17-600-763-6-1 MRC's: NA 17-600-763-6-2

The Mobile Facility Program provides all electrical power required by a mobile facility complex. For example, DOD-standard diesel-engine-driven generator sets are used as 50-60 Hz power sources.



MEP-807A

NSN: 6115-01-296-1463

Description: 100kW at 50/60 Hz Tactical Quiet, Skid

Mounted, Generator Set

Nomenclature: Generator Set, Skid Mounted, Tactical

Quiet

TQG: 807A **TEC**: GAHK **WUC**: 33AP0

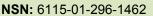
Model: 100kW/60Hz Manufacturer: Fermont Volts: 120/208 or 240/416 Frequency (Hz): 50/60 Speed (RPM): 2400

Phase: 3

Weight: 5900 lbs.(operational)
Dimensions: 106" L x 40" W x 65" H
Transport: M1061A1 5-ton trailer

Fuel: Diesel DL-1, DL-2; or Jet Fuel JP-5 and JP-8

MEP-809A



Description: 200kW at 60 Hz; 166kW at 50 Hz Tactical Quiet, Skid Mounted, Generator Set

Nomenclature: Generator Set, Skid Mounted, Tactical

Quiet

TQG: 809A TEC: GAHL WUC: 33AQ0

Model: 200kW/60Hz Manufacturer: Fermont Volts: 120/208 or 240/416 Frequency (Hz): 50/60 Speed (RPM): 1800/1500

Phase: 3

Weight: 9080 lbs.(operational)

Dimensions: 114" L x 50" W x 75" H

Transport: M1061A1 5-ton trailer

Fuel: Diesel DL-1, DL-2; or Jet Fuel JP-5 and JP-8



SMFC

NSN: 6130-01-543-7581

Description: 50/60 to 400 HZ Static Mobile

Frequency Converter

Nomenclature: Static Mobile Frequency

Converter
MRC: AGAV
Model: A/M24M-5
P/N: 1000AG1000-1

Manuf.: Aviation Ground Equipment Corp.

Weight: 3925 lbs.

Dimensions: 106" L x 40" W x 65" H **Transport:** Towed or manually moved

<u>INPUT</u>

Voltage Range: 440/220 VAC Configuration: 3-Phase Freq Range: 50 to 60 Hz

<u>OUTPUT</u>

Voltage: AC: 115/200 v, DC: 270 v and 28 v

Configuration: 3-Phase Frequency: 400 Hz

Overload: 110% for 60 min/125% for 5 min/

150% for 2 min, 200% for 20 sec



When 400 Hz power is required, it is furnished by rotary or solid state frequency changers . SMFCs (Static Mobile Frequency Converters) and MMGs (Mobile Motor Generators) are used to convert 440/220 VAC 50/60 Hz input power to 115/200 VAC, 3-phase, 400 Hz and 270 VDC and 28 VDC output power. The SMFCs and MMGs are not self-propelled and must be towed or manually moved. The 4-wheel trailers are equipped with tie-down rings, pneumatic tires, a mechanical hand brake, and a tow bar for towing and steering. The SMFCs and MMGs operate worldwide in rugged military environments and support MFs on shipboard and shore based sites. In the future the MMG will be replaced by the SMFC



The Program also includes internal 400 Hz frequency converters installed in certain configurations depending upon power requirements.



ECU-108/E

NSN: 6130-01-368-5734

Description: 60 to 400 HZ Electronic Frequency

Converter

Nomenclature: Electronic Frequency Converter

Model: CR-074-3P P/N: 1737AS100-1 Manufacturer: Unitron Weight: 250 lbs.

Dimensions: 17.5" H x 19" W x 24" D

<u>INPUT</u>

Voltage Range: 120/208 VRMS Configuration: 3-Phase, 4 Wire Freq Range: 45 to 66 Hz

OUTPUT

Voltage: 120/208 VRMS

Configuration: 3-Phase, 4 Wire

Frequency: 400 Hz Power: 2.5 to 7.5 kVA

Overload: 125% for 1 min/150% for 5 sec



ECU-130/F

NSN: 6RD-6625-01-552-1659-SX

Description: 400 Hz, 10 kVA Frequency

Converter

Nomenclature: Electronic Frequency Converter

Model: PS-94-450-1 P/N: 80-18007-1 Manufacturer: Unitron Weight: 145 lbs.

Dimensions: 17.3" H x 19" W x 25.6" D

INPUT

Voltage Range: 115/200 VRMS

Configuration: 3-Phase, wye, grounded neutral

Frequency Range: 30 to 600 Hz

OUTPUT

Voltage: 115/200 VRMS Configuration: Single Phase

Frequency: 400 Hz

Power: 10 kVA continuous

Overload: 125% for 5 min/175% for 10 sec

The Power Distribution Box (PDB) is the major component of the Mobile Facility Program Tactical Electrical Power Distribution System. Three 200-KW generators may be connected to the PDB; one in standby and two paralleled and operational. The PDB is constructed with forklift pockets and lifting rings for ease of movement.

Normally, the PDB supplies power to Integration Unit Mobile Facilities (INU) and Mobile Electric Power Plants, type MMG-1As. To accomplish this, each end of the PDB includes seven receptacles consisting of six 200-amp and one 100-amp connector. Each connector is protected by a weatherproof circuit breaker. One external weatherproof receptacle rated at 115/120-VAC, 20-amp, single phase, is provided for utility use. It is protected by a 20-amp Ground Fault Circuit Interrupter (GFCI) circuit breaker. Power input is 120/208-VAC, 1200-amp, 60-Hz, 3-phase wye, 5-wire and the power output is 120/208-vac, 100/200-amp, 60-Hz, 3-phase wye, 5-wire.

The PDB weighs 2000-lbs., is 76.5 in. high, 46-in wide, and 120-in long. Power cables provided with the system connect the generator adapter panel at each generator to the PDB. This equipment allows rapid, efficient distribution of electricity from high output generators to a large number of smaller electrical loads.





Power Distribution Box

NSN: 6RD-4920-01-559-1148-SX

Description: 200 KW Portable Load Bank **Nomenclature:** Load Bank, Portable, 200 KW

Type Designator: MXU-1004/E Part Number: LPH200D35584

Manufacturer: Avtron Aerospace, Inc.

Cage: 01014

SERD: MF256 SM&R Code: PEGGG

Volts: 240/480 VAC

Frequency (Hz): 60 Phase: 3

Load Step Resolution (KW): 5, 10, 10, 25, 50, 100

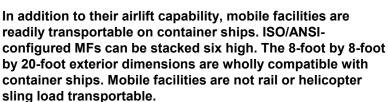
Weight: 650 lbs.

Dimensions: 47.50" L x 33.75"W x 50.25"H

Load banks are portable, self-contained units that simulate electrical loads for testing power sources such as diesel generating systems and Uninterruptible Power Supplies (UPS). Load banks are also used to reduce "wet stacking" problems in diesel engines of backup generating systems. Manufactured elements are made of a corrosion resistant chromium alloy and are fully supported across their entire length on stainless steel support rods with segmented ceramic insulators. Elements are carefully selected to operate at low temperatures to provide extended, reliable performance, eliminating the need for a "cool down" period after load bank operation.

The primary cause of diesel engine failure is "wet-stacking" ("wet" unburned fuel accumulating in the engine "stack"). It is caused by under-loading of the generator. Diesel engines that are lightly loaded, or allowed to idle for long periods, never reach their recommended operating temperature. Over time, unburned fuel coats the combustion chamber, reducing engine rating, efficiency, and life span. Load banks provide minimum load on generators required to prevent wet stacking. A preventive maintenance plan that includes load testing of a diesel generator set, will reduce the harmful effects of wet-stacking and increase engine life.

Transporting components of a mobile facility (MF) complex to a forward area anywhere in the world is a simple task for the C-130 Hercules, C-17A Globemaster and C-5A Galaxy aircraft. Two MFs will fit snugly within the C-130, three in the C-17A and eight in the cavernous interior of the C-5A. These cargo planes can expeditiously carry an entire MF complex to an airbase or forward expeditionary airfield. There, each MF will be offloaded, moved by air-ride flatbed trailer and complexed into a completely operational aircraft support facility within a few hours.

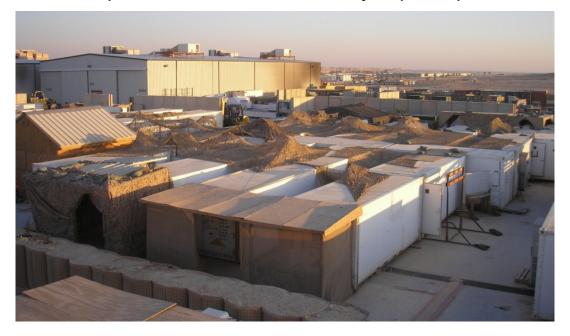




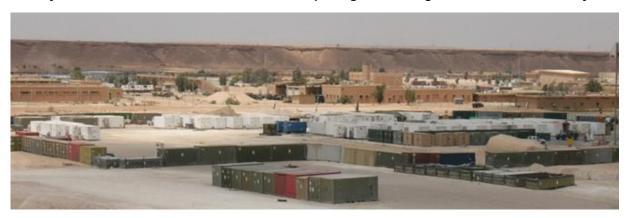


One of the most important features of the Program is the ability to complex two or more Mobile Facilities (MFs) into a functional entity in order to perform a common task. This capability allows users to integrate several work functions into one environmentally controlled work space.

Complexing is normally accomplished by using a combination of basic mobile facilities, Side Opening Mobile Facilities (SOMF), INtegration Unit (INU) mobile facilities and ancillary equipment such as butting kits, walkways, and electrical power distribution cables. Essential ancillary equipment is provided with the mobile facilities and integration unit mobile facilities in accordance with requirements identified in the mobile facility complex site plan.



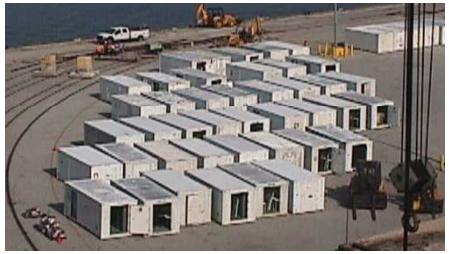
The key to mobile facility complexing is the integration unit, which has three removable side panels (two on the left side of the unit and one on the right side). By using a butting kit, basic mobile facilities can be joined to each other end-to-end or to an opening in the integration unit mobile facility.



A specially designed complexing and decomplexing tool (CDT) is used to maneuver individual mobile facilities in complexing scenarios. The CDT allows MFs to be moved a short distance over relatively smooth surfaces using a forklift, tug or man power.







Once mobile facilities and integration units are joined into a complex, butting kits are attached between the complexed shelters to form a weather-tight seal. Ancillary equipment such as walkways and power distribution cables are also installed. After complexing the shelters, technicians can initiate the equipment checkout process.





Through creative planning, a mix of basic mobile facilities and side opening mobile facilities can be used in conjunction with an integration unit mobile facility to create a basic complex. Several basic complexes can be joined at the ends of the integration units to form a mobile facility complex of up to 41 MFs to perform a variety of functions.

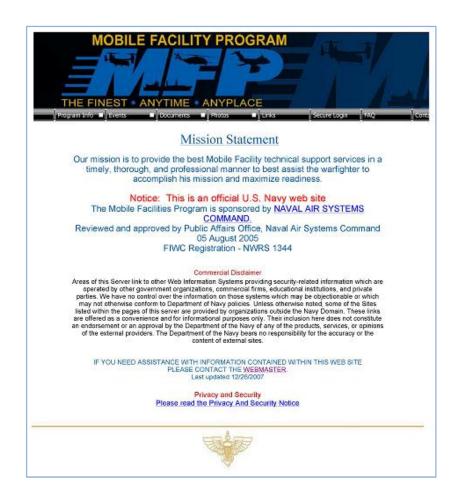




The site plan is a design for installing a number of mobile facilities in a particular space to accomplish a specific function. It takes into account such operational concepts as the number of shelters involved, integration unit and mobile facility mix, installation space available, utilities required, utilities available, generator sets, power distribution box, etc., and functions supported by the mobile facility complex. A well conceived site plan is essential to the installation process and efficient operation of the units after installation.

Complexing enlarges the entire scope of the Mobile Facility Program. While a single shelter may have restricted usefulness, an integrated complex can provide unlimited capability.





The Mobile Facilities Program has a website available for commands to access detailed information concerning the program.

The Website can be reached at:

http://www.mobile-facilities.com/



Mobile Facility Program POC

For more information concerning our program please contact us at:

Mobile Facility Program

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Work: (301)757-0747 DSN: 757-0747 Fax: (301)757-5096

Email: MFDepMgr@mobile-facilities.com

Mobile Facilities Configuration Sites

Mobile Facilities Configuration Site North Island, CA

DoDAAC/UIC: N65888

Fleet Readiness Center Southwest Naval Base Coronado, Code 6.7.6.2.0 San Diego, CA 92135

Work: (619)545-2312 DSN: 735-2312

Fax: (619)545-4595

Email: WestCoast@mobile-facilities.com

Mobile Facilities Configuration Site

Norfolk, VA

DoDAAC/UIC: N58070 NAVAIR MFCS Norfolk Bldg NM-92, 8581 Patrol Rd Norfolk, VA 23511-4213

Work: (757)444-7334/5752 DSN: 564-7334/5752 Fax: (757)444-7132

Email: EastCoast@mobile-facilities.com



Mobile Facility Program



http://www.mobile-facilities.com/